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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/509,875

06/03/2005

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121059

4964

25944 7590 02/17/2009

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EXAMINER

SYKES, ALTREV C

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

02/17/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/509,875	<b>Applicant(s)</b> SCHWUNG ET AL.	
	<b>Examiner</b> ALTREV C. SYKES	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 6-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 12-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Examiner acknowledges the amendment to the claims filed September 23, 2008. It has been considered and entered.

### ***Response to Arguments***

2. Applicant's arguments, see pg. 5, filed September 23, 2008, with respect to claims 1-5 and 12 rejected under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive in view of the amendment to the claims. The rejection of claims 1-5 and 12 in this regard has been withdrawn.
3. Applicant's arguments filed September 23, 2008 have been fully considered but they are not persuasive.

Applicant argues the rejection of claims 1-5 and 12 under 35 U.S.C. 103(a) over Shue et al. (US 4,489,129) in view of Harris (US 4,910,289). Applicants recite that claim 1 requires that "a proportion of polyphenylene sulfide relative to the reinforcing fibers is 0.001 to 0.01 percent by weight." As acknowledged by the Office Action on page 5, Shue does not teach or suggest such a feature. Applicants further argue that Harris does not cure this deficiency and the art is not analogous.

Examiner is not persuaded. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Shue discloses a coating for reinforcing fibers which

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would later be incorporated in suitable plastics including thermoplastics. (See Col 1, lines 4-10 and 49-56) Poly(phenylene sulfide) is the preferred polymer and may be a homopolymer, copolymer, terpolymer or a blend of such polymers. (See Col 2, lines 49-61) Shue further discloses that the amount of polymer coating on the reinforcement after curing can vary widely. The invention is not limited thereto but it is contemplated that *for most purposes* the weight percentage of polymer coating will range from about 0.1 to about 10 weight percent. (See Col 3, lines 20-24 emphasis added) Therefore, examiner finds that there is a sufficient suggestion in Shue to modify the amount of polymer coating on reinforcements. Examiner also notes that since the coated reinforcements are to be incorporated into a plastic to improve strength, stiffness, fatigue life and other properties of a plastic, one of ordinary skill in the art would recognize that the same final properties would result if instead of coating the fibers with PPS and then incorporating them into a thermoplastic melt that a blended coating of thermoplastic and PPS be used on the fibers from the beginning like that taught in Harris. One would be motivated to do so at least to cut down on processing steps.

Harris discloses a blend of poly(aryl ether ketone) and PPS which may be fabricated into a coating or moulding. These compositions display excellent mechanical properties as well as excellent chemical and heat resistance. (See Abstract and Col 22, lines 42-45) Harris discloses that enhanced properties include strength and toughness as well as wear and abrasion resistance. (See Col 2, lines 37-40) Therefore, examiner has reason to believe that the coatings of Shue and Harris are reasonably pertinent to the

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particular problem with which the applicant was concerned, therefore the art is deemed analogous. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

Further regarding the limitation of “polyphenylene sulfide relative to the reinforcing fibers is 0.001 to 0.01 percent by weight”, examiner notes that Harris specifically teaches the discovery that such small amounts of the PPS additive (< 2 weight percent) are effective in promoting fast crystallization rates was totally unexpected. (See Col 4, lines 15-19) Therefore, examiner notes that the use of less than 2 weight percent of PPS was known in the art for a coating composition whether or not it was optimized and truly appreciated at the time of the Harris invention. Harris even discloses that the coating may contain reinforcing fibers. (See Col 22, lines 36-39) As such, to substitute the coating composition as taught by Harris in place of the composition of Shue for the reinforcing fibers would provide for the limitations of a coated reinforcing fiber having substantially small amounts of PPS thereon. It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the percent of polyphenylene sulfide since it has been held that, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Further, it has been well settled that “the fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.” *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd.Pat. App. & Inter. 1985) As the composition components are known for providing at least

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enhanced mechanical properties and strength, the unexpected results of applicant would have also been provided for. (See Applicant Remarks pg. 5-6)

Applicant argues the assertion that the coating composition of Harris would crystallize faster than a coating composition of Shue.

After further consideration examiner agrees with applicant, however the examiner maintains the position as set forth above. As recited in Harris, small amounts of PPS were capable of increasing the crystallization of the composition. Therefore, a composition containing any amount of PPS would crystallize similarly at a reasonable rate. Examiner also notes that applicant relies on the argument that Shue discloses that the polymer coatings can be 100% PPS. Examiner was unable to find such a limitation in the Shue disclosure. Therefore the arguments utilizing this rationale are moot. Examiner also notes applicants' assertion that the last mailed office action asserted that one of ordinary skill adds PPS to Shue's polymer coating already containing PPS. (See pg. 11) Examiner finds this to be erroneous as the coating of Shue was to be replaced by the coating taught by Harris as recited in the last mailed office action.

Regarding the assertion made by examiner that it would have been obvious to one of ordinary skill in the art to utilize the lesser amounts of PPS to save materials and cut costs, examiner is persuaded. However, examiner finds this point to be of no moment and maintains the position as set forth above.

4. Applicant argues the rejection of claims 13-16 under 35 U.S.C. 103(a) over Harris (US 4,910,289) citing that Harris is silent as to any amount of fibers used in the composition

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and does not teach or otherwise suggest any ratio of weight percent of PPS to reinforcing fibers.

Examiner is not persuaded. As simply as claimed, Harris discloses a coating composition which may comprise reinforcing fibers wherein the coating comprises PPS. (See Abstract and Col 22, lines 42-45) Therefore, examiner has reason to believe that coated reinforcing fibers are met by the prior art. While Harris is not explicit to the proportion of polyphenylene sulfide relative to the reinforcing fibers, examiner has reason to believe that one of ordinary skill in the art would have been easily motivated to optimize the range as Harris discloses that modifying the PPS would aid in controlling the crystallinity of the thermoplastic polymers. Examiner notes one of ordinary skill in the art would have appreciated the disclosure of Harris and would have been easily motivated by expected success to tailor the amount of PPS to reinforcing fiber in order to provide sufficient strength in final use of the composition.

5. For the reasons set forth above, applicants' request for rejoinder is denied. The expression special technical features is defined as meaning those technical features that define the contribution which each claimed invention, considered as a whole, makes over the prior art." MPEP 1893.03(d) As such, and as evidenced by Shue et al. (US 4,489,129) in view of Harris (US 4,910,289) there is not a contribution over the prior art for the recited single inventive concept as acknowledged by Applicant. Examiner notes that the combined references provide for a prima case of obviousness for the claimed range of applicant since Harris discloses the discovery that such small amounts of the PPS additive (< 2 weight percent) are effective in promoting fast crystallization rates was

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totally unexpected. (See Col 4, lines 15-19) While it is noted that the small amount of PPS as a coating for fibers was directed at increasing interlaminar shear strength and bending strength of composites containing the fibers as recited by applicant in the remarks and specification, applicant is reminded that it is well settled that “the fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.” Ex parte Obiaya, 227 USPQ 58, 60 (Bd.Pat. App. & Inter. 1985). Therefore, it has been well settled that the recitation of an additional advantage associated with doing what the prior art suggests does not lend patentability to an otherwise unpatentable invention. See MPEP 2145. Finally, it is noted that Harris discloses these composition display excellent mechanical properties such as high strength and toughness. (See Col 1, lines 15-17 and 37-40)

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.



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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. Claims 1-5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shue et al. (US 4,489,129) in view of Harris (US 4,910,289).

Regarding claims 1 and 2, Shue et al. discloses reinforcements are treated with a curable polymer such as, for example, poly(phenylene sulfide) and then subjected to conditions sufficient to cure the polymer. (See Col 1, lines 49-52) The reinforcements produced in this manner can be incorporated into a plastic and include carbon, glass, boron, silica, quartz, asbestos, mica and organic material. (See Col 1, lines 52-56 and 64-68) The amount of polymer coating on the reinforcement after curing can vary widely. It is contemplated that for most purposes the weight percentage of polymer coating will range from about 0.1 to 10 weight percent. (Col 3, lines 20-24) Therefore, examiner finds that there is a sufficient suggestion in Shue to modify the amount of polymer coating on reinforcements. Shue et al. discloses all of the claim limitations as set forth above but the reference does not specifically disclose wherein a proportion of polyphenylene sulfide relative to uncoated reinforcing fibers is 0.001 to <0.01 percent by weight.

Harris discloses miscible poly(aryl ether ketone) blends. The composition contains (a) from about 98 to 99.9 percent by weight of a miscible poly(aryl ether ketone) blend, and (b) from about 0.1 to about 2 percent by weight of a poly(phenylene sulfide) or a copolymer thereof. (See Col 1, lines 7-12) Harris discloses the blend of poly(aryl ether ketone) and PPS may be fabricated into a coating or moulding. These compositions display excellent mechanical properties as well as excellent chemical and heat resistance. (See Abstract and Col 22, lines 42-45) Harris discloses that enhanced properties include

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strength and toughness as well as wear and abrasion resistance. (See Col 2, lines 37-40)

Harris also discloses that the discovery that such small amounts of the PPS additive (< 2 weight percent) are effective in promoting fast crystallization rates was totally unexpected. (See Col 4, lines 15-19) The compositions may also include mineral fillers as well as reinforcing fibers such as fiberglass, carbon fibers, and the like. (See Col 22, lines 35-40)

As Shue et al. and Harris are both directed to coatings containing polyphenylene sulfide and reinforcing fibers for strengthening plastic, the art is analogous. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention motivated by expected success to utilize the coating composition of Harris in place of the coating composition as disclosed by Shue et al. in order to tailor the amount of PPS to reinforcing fiber in order to provide sufficient strength in final use of the composition. (See Col 1, lines 15-18 and Col 22, lines 42-46)

9. Further regarding claims 1 and 2, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the percent of polyphenylene sulfide since it has been held that, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). The burden is upon the Applicant to demonstrate that the claimed amount of polyphenylene sulfide is critical and has unexpected results. In the present invention, one would have been motivated to optimize the polyphenylene sulfide motivated by the desire to provide

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excellent mechanical properties such as high strength and toughness to the plastics of Shue. (See Harris Col 1, lines 15-17 and 37-40)

Regarding claims 3-5 and 12, modified Shue et al. discloses all of the claim limitations as set forth above.

Additionally, modified Shue et al. discloses a composite material:

- wherein the coating comprises polyphenylene sulfide and a thermoplastic material. (See Harris Col 4, lines 9-15, wherein poly(aryl ether ketone) is a thermoplastic material)
- the reinforcing resin is a thermoplastic or a mixture of thermoplastics. (See Harris Col 4, lines 9-15)
- wherein the reinforcing fibers are carbon fibers, fiberglass, and the like. (See Harris Col 22, lines 36-39)
- Components for aircraft construction, automobile construction, machine construction or plant construction, and medical components, comprised of the composite material as set forth above. (See Harris Col 22, lines 42-46 wherein the blends may be fabricated into any desired shape and are particularly desirable for use as electrical insulation for electrical conductors.)

10. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris (US 4,910,289).

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Regarding claims 13 and 14, Harris discloses miscible poly (aryl ether ketone) blends. The composition contains (a) from about 98 to 99.9 percent by weight of a miscible poly(aryl ether ketone) blend, and (b) from about 0.1 to about 2 percent by weight of a poly(phenylene sulfide) or a copolymer thereof. (See Col 1, lines 7-12) Harris discloses the blend of poly(aryl ether ketone) and PPS may be fabricated into a coating or moulding. These compositions display excellent mechanical properties as well as excellent chemical and heat resistance. (See Abstract and Col 22, lines 42-45) Harris discloses that enhanced properties include strength and toughness as well as wear and abrasion resistance. (See Col 2, lines 37-40) Harris also discloses that the discovery that such small amounts of the PPS additive ( $< 2$  weight percent) are effective in promoting fast crystallization rates was totally unexpected. (See Col 4, lines 15-19) The compositions may also include mineral fillers as well as reinforcing fibers such as fiberglass, carbon fibers, and the like. (See Col 22, lines 35-40) As simply as claimed, Harris discloses a coating composition which may comprise reinforcing fibers wherein the coating comprises PPS. (See Abstract and Col 22, lines 42-45) Therefore, examiner has reason to believe that coated reinforcing fibers are met by the prior art.

Further regarding claims 13 and 14, Harris discloses all of the claim limitations as set forth above but the reference does not disclose wherein a proportion of polyphenylene sulfide relative to the reinforcing fibers is 0.001 to  $< 0.01$  wt %. It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the percent of polyphenylene sulfide since it has been held that, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the

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optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). The burden is upon the Applicant to demonstrate that the claimed amount of polyphenylene sulfide is critical and has unexpected results. In the present invention, one would have been motivated to optimize the polyphenylene sulfide motivated by the desire to provide excellent mechanical properties such as high strength and toughness to the composites of Shue. (See Harris Col 1, lines 15-17 and 37-40)

Regarding claims 15-16, Harris discloses reinforcing fibers wherein:

- wherein the coating comprises polyphenylene sulfide and a thermoplastic material. (See Col 4, lines 9-15, wherein poly(aryl ether ketone is a thermoplastic material)
- wherein the reinforcing fibers are carbon fibers, fiberglass, and the like.  
(See Col 22, lines 36-39)

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALTREV C. SYKES whose telephone number is (571)270-3162. The examiner can normally be reached on Monday-Thursday, 8AM-5PM EST, alt Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/  
Supervisory Patent Examiner, Art Unit 1794

/ACS/  
2/3/09